

CLAIMS

1. An air conditioning apparatus for a vehicle having a passenger compartment, said air conditioning apparatus comprising:

an air conditioning case having at one end thereof an inside-air suction port for sucking inside air and an outside-air suction port for sucking outside air and at the other end at least a first air opening portion for blowing air toward a lower portion of the passenger compartment and a second opening portion for blowing air toward an inner surface of a windshield;

a partition member for partitioning an interior of said air conditioning case into a first air passage extending from said inside-air suction port to said first air opening portion and a second air passage extending from said outside-air suction port to said second air opening portion;

a blower for blowing air in said first air passage and said second air passage from said one end side to the other end side;

a cooling heat exchanger disposed in said first air passage and said second air passage, for cooling air passing through said first air passage and said second air passage;

a heating heat exchanger disposed in said first air passage and said second air passage at a downstream side of said cooling heat exchanger, for heating air passing through said first air passage and said second air passage;

a temperature sensor disposed at a side of at least one of said first air passage and said second air passage, for detecting a cooling temperature of said cooling heat exchanger;

adjusting means for adjusting a refrigerant amount flowing into said cooling heat exchanger;

adjusting control means for comparing a cooling temperature detected by said temperature sensor and a set temperature and for controlling operation of said adjusting means; and

changing means for changing the set temperature according to a temperature of outside air.

3. An air conditioning apparatus according to Claim 1, wherein:
said temperature sensor is disposed at said second air passage side, and

said changing means decreases the set temperature according to a decrease in the temperature of outside air.

4. An air conditioning apparatus according to Claim 1, further comprising:

signal generating means for generating a signal according to the temperature of outside air;

wherein said changing means includes set temperature determining means for receiving the signal of said signal generating means and for changing the set temperature stepwise by two steps or more according to the temperature of outside air.

5. An air conditioning apparatus according to Claim 1, wherein:
said air conditioning case has at the other end a third opening portion for blowing air toward an upper portion of the passenger compartment,
and

said third opening portion and said second opening portion communicate with a downstream side of said second air passage.

6. An air conditioning apparatus according to Claim 1, further comprising:

an inside air/outside air switching box for setting any one of:

an inside air/outside air double laminar mode in which inside air is introduced into said first air passage and outside air is introduced into said second air passage,

an outside air mode in which outside air is introduced into both of said first air passage and said second air passage, and

an inside air mode in which inside air is introduced into both of said first air passage and said second air passage.

7. An air conditioning apparatus according to Claim 1, wherein:
said cooling heat exchanger is an evaporator which constitutes a refrigeration cycle with a compressor for compressing refrigerant, a condenser for condensing the refrigerant from said compressor, and decompressing means for decompressing the refrigerant from the condenser, said evaporator being for evaporating the refrigerant from said decompressing means.

8. An air conditioning apparatus according to Claim 1, wherein said temperature sensor is disposed at a downstream side of said cooling heat exchanger.

10. An air conditioning apparatus for a vehicle having a passenger compartment, said air conditioning apparatus comprising:

an air conditioning case having at one end thereof an inside-air suction port for sucking inside air and an outside-air suction port for sucking outside air and at the other end at least a first air opening portion for blowing air toward a lower portion of the passenger compartment and a second opening portion for blowing air toward an inner surface of a windshield;

a partition member for partitioning an interior of said air conditioning case into a first air passage extending from said inside-air suction port to said first air opening portion and a second air passage extending from said outside-air suction port to said second air opening portion;

a blower for blowing air in said first air passage and said second air passage from said one end side to the other end side;

a cooling heat exchanger disposed in said first air passage and said second air passage, for cooling air passing through said first air passage and said second air passage;

a heating heat exchanger disposed in said first air passage and said second air passage at a downstream side of said cooling heat exchanger, for heating air passing through said first air passage and said second air passage;

a temperature sensor disposed at a side of said second air passage, for detecting a cooling temperature of said cooling heat exchanger;

adjusting means for adjusting a refrigerant amount flowing into said cooling heat exchanger; and

adjusting control means for comparing a cooling temperature detected by said temperature sensor and a set temperature for controlling operation of said adjusting means.

19. An air conditioning apparatus according to Claim 6, wherein:

said partition member has a communication path through which said first air passage and said second air passage communicate with each other;

during said inside air/outside air double laminar mode, said communication path is closed so that inside air from said inside-air suction port is introduced into said first air opening portion through said first air passage and outside air from said outside-air suction port is introduced into said second opening portion through said second air passage;

during said outside air mode, said communication path is opened so that outside air from said outside-air suction port is introduced into said second air passage while being introduced into said first air passage through said communication path.

20. The air conditioning apparatus according to Claim 10, wherein:

said cooling heat exchanger is an evaporator of a refrigerant cycle;

and

said refrigerant cycle includes a compressor for compressing refrigerant, a condenser for condensing refrigerant from said compressor, a decompression unit for decompressing refrigerant from said condenser, and the evaporator for evaporating refrigerant from said decompression unit.

21. The air conditioning apparatus according to Claim 10, wherein said temperature sensor is disposed in said second air passage at a position immediately downstream from said cooling heat exchanger.

22. The air conditioning apparatus according to Claim 10, wherein said adjusting control means control said adjusting means in such a manner that, cooling operation due to said cooling heat exchanger is performed when temperature detected by said temperature sensor is higher than predetermined temperature, and the cooling operation due to said cooling heat exchanger is stopped when the temperature detected by said temperature sensor is lower than the predetermined temperature.

23. The air conditioning apparatus according to Claim 10, further comprising:

an inside air/outside air switching box for setting any one of:

an inside air/outside air double laminar mode in which inside air is introduced into said first air passage and outside air is introduced into said second air passage;

an outside air mode in which outside air is introduced into both said first air passage and said second air passage; and

an inside air mode in which inside air is introduced into both said first air passage and said second air passages.

24. An air conditioning apparatus according to Claim 23, wherein:

said partition member has a communication path through which said first air passage and said second air passage communicative with each other;

during said inside air/outside air double laminar mode, said communication path is closed so that inside air from said inside-air suction port is introduced into said first air opening portion through said first air passage and outside air from said outside-air suction port is introduced into said second opening portion through said second air passage;

during said outside air mode, said communication path is opened so that outside air from said outside-air suction port is introduced into said

second air passage while being introduced into said first air passage through said communication path.